

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Appln. of:

BAILEY et al.

Application No. 10/018,061

For: CATHODE PLATE

**DECLARATION BY REVILL WAYNE ARMSTRONG**

Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

I, Reville Wayne Armstrong, of 5 Kyong Place, Annadale, Queensland 4814, Australia, hereby declare:

1. I am a person named as co-inventor of the invention described in United States Patent Application No. 10/018,061. Considering the grounds of rejection set forth in the USPTO Office Action mailed 1 November 2006, I provide the following comments.
2. The referenced USPTO Office Action rejects the pending claims 1, 2, 4-9 and 11-14 under 35 USC 103(a) as being obvious in light of CA 910,844. Of the rejected claims, I understand that the present invention is most broadly defined according to the pending independent claims 1 and 8, which recite:

*Claim 1* A method of electro-depositing an envelope of metal on a cathode comprising:

depositing said envelope on said cathode, said envelope including deposited metal on either side of said cathode joined along at least one edge by a frangible portion, and being removable from said cathode by rotation of respective sides of the deposited metal envelope about the frangible portion to separate the deposited metal from the cathode into two substantially equivalent sheets,

providing a groove on said cathode plate, depositing metal on and adjacent to said groove to form said frangible portion, and

wherein said groove is shaped such that a line of weakness is formed in the metal deposited within the groove such that separation of the two sheets of deposited metal is initiated along said line of weakness, and

wherein the sides of the groove are between 75 and 105° apart.

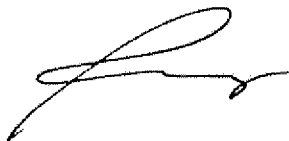
*Claim 8* A cathode plate for electro-deposition of an envelope of metal, said cathode plate having a groove along at least one edge and shaped such that, in use, a line of weakness is formed in the metal deposited within the groove, whereby during stripping of metal from said cathode, separation of the envelope of metal into two substantially equivalent sheets is initiated along said line of weakness, and wherein the sides of the groove are between 75 and 105° apart.

3. I have considered the USPTO Examiner's reasoning as to the rejection of these claims, and I respectfully disagree on the following bases.
4. The cited prior art document CA 910,844 relates to a method for use in the electrorefining or electrowinning of copper, wherein relatively high purity copper is deposited directly upon reusable, plate-like, relatively rigid, edge-masked cathode blanks in deposits which are relatively heavy. After deposition, the deposited copper is stripped from the cathode blank for melting.
5. Whilst the USPTO Examiner admits that CA 910,844 does not specifically disclose the angle of the V-groove applicable to either the invention of CA 910,844, or of the present invention, he nonetheless comments that:

“one having ordinary skill in the art would have the ability to perform routine experimentation in order to optimize this plane of weakness” and “figure no. 3 of the CA patent shows the v-groove used in the bottom of the plate and it appears to be in the range as set forth in applicant's instant claims”.

6. Fig.3 of CA 910,844 provides the only exemplification as to the V-groove angle applicable to CA 910,844; this angle is of the order of  $50^{\circ}$ , whereas that according to the present application is  $90 \pm 15^{\circ}$ . This limitation is defined in the independent claims 1 and 8 presently rejected by the USPTO.
7. I have read and understood the Request for Reconsideration filed with the USPTO on 3 August 2006 (attached herewith), and agree with the comments made therein in their entirety.
8. The present invention was developed up to 1999 in order to resolve certain difficulties associated with stripping deposited metal from reusable cathodes. Some of these problems are discussed in the present specification. In particular, the need for the span of the V-groove to be large enough for copper to be deposited in the groove and thereby produce fracture or crack initiation within the groove (as opposed to on the outside of the groove) but not so large that it completely fills with deposited material to such an extent that the material cannot be released cleanly.
9. If the balance of deposited material within the V-groove is not optimal, as provided for in the inventive  $90 \pm 15^{\circ}$  span defined by the present invention, cracks are initiated on the outside of the groove and a small hook or lip is formed as shown in Fig.3 of the present application. As discussed in the present specification, the approximate  $50^{\circ}$  span of the prior art groove in CA 910,844, as shown in Fig.3 thereof, does not provide for clean release the deposited metal from the cathode. In many cases, the lip or hook thus formed extends along almost the entire end portion of the deposited metal. This lip is unsightly, dangerous (since it fouls packing and stripping machinery), and gives uneven weight distribution to the respective sides of the deposited metal.

10. The present inventors have overcome such difficulties as discussed in the attached Request for Reconsideration, *i.e.* by determining the precise angle range of  $90 \pm 15^\circ$  for the V-groove.
11. The resultant cathode plate has been used reliably since its inception. It provides for a significantly cleaner and more reliable stripping of the deposited metal into "two substantially equivalent sheets", without the aforementioned hooks or lips, unlike the prior art techniques disclosed in CA 910,844.
12. The inventive range of  $90 \pm 15^\circ$  for the V-groove is not discussed in CA 910,844. Moreover, the relatively narrow span of the V-groove specifically disclosed therein is of the order of  $50^\circ$ , which in my opinion, would render any cathode comprising such a V-groove susceptible to the problems discussed in paragraph 9, above.
13. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.



Date: 30<sup>th</sup> March 2007

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Revill Wayne Armstrong

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application

David BAILEY et al

Application No.: 10/018,061

Examiner: Bruce F. Bell

Filed: December 14, 2001

Group Art Unit: 1746

For: CATHODE PLATE

**REQUEST FOR RECONSIDERATION AFTER FINAL REJECTION**

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the Office action mailed April 3, 2006, Applicant respectfully petitions for a One-Month Extension of Time and requests consideration of the following Remarks.

## REMARKS

Claims 1, 2, 4-9, 11 -14 are pending.

I. 35 U.S.C. §103(a) Rejection of Claims 1, 2, 4-9 and 11-14

Claims 1, 2, 4-9, and 11-14 stand rejected under 35 USC §103(a) as allegedly being unpatentable over CA 910844. This rejection is respectfully traversed.

The Office Action admits CA '844 does not specifically disclose the angle of the V-groove. However, the Office Action states "one having ordinary skill in the art would have the ability to perform routine experimentation in order to optimize this plane of weakness" and "figure no. 3 of the CA patent shows the v-groove used in the bottom of the plate and it appears to be in the range as set forth in applicant's instant claims."

It is respectfully submitted the Office Action is incorrect on both counts.

A. Fig. 3 shows a groove of approximately 50 degrees

Firstly, referring to Fig. 3 of CA '844 it can be seen that the groove is approximately 50 degrees. A marked up copy of Fig. 3 of CA '844 indicating this is attached (ATTACHMENT I). This is clearly well below the range of the present application. The lower limit of the present application requires a V-groove of around 75 degrees. The 50 degrees shown in Fig. 3 is nowhere near this the claimed lower limit.

B. The present invention was not achieved with routine experimentation

Further, as discussed in the present application it is by no means routine experimentation which has resulted in the presently claimed invention. There have been significant problems in the prior art of the deposited metal not cleanly and clearly separating from the cathode plate. The present specification itself, and experience in the art, shows the system disclosed in the cited prior art does not satisfy current production requirements and speeds. In addition, arriving at the present invention is not simply a matter of experimentation. Rather it is a matter of determining the cause of this problem and determining a solution for stripping of the deposited copper by various techniques and at various speeds.

A careful analysis of the problem and providing a solution for that problem is the subject of the present application. At first instance, for example, the problem of unequal separation could have been caused by excessive deposition of material inside the V-groove.

Accordingly, the solution may have been to prevent any deposition of copper in the V-groove. This is in fact similar to conventional systems which have a deposition barrier, e.g., wax, formed along the bottom edge of the cathode plate.

The present Applicants, however, found this was not in fact the case. The Applicants surprisingly found that, if anything, the V-groove needed to be expanded over the prior art to allow deposition of copper inside the V-groove. This is contrary to conventional thinking since additional deposition of copper would, it may have been thought, cause additional strength and thereby additional problems with separating the two sides of the deposited material.

Unexpectedly, this was not in fact the case. The "opening up" of the V-groove to 75-105 degrees allowed deposition of copper into the V-groove which, when subjected to the stripping process, allowed the deposited copper on either side to be separated into substantially equivalent sheets.

The whole thrust of CA '844 is not to provide two substantially equivalent sheets, but rather to prevent damage to the cathode mother plate. CA '844, page 8, line 10 describes the use of a parting medium in which to strip the copper, i.e., "In the case of copper and stainless steel blanks, it is advantageous to coat them with a parting medium to reduce adherence of the deposited copper".

On the same page, CA '844 states "copper can be stripped or peeled away from the blanks in two pieces without damaging the blanks." Further, page 8, lines 26-27, states "the plane of weakness in the bottom edge deposit eliminates any serious interference with a stripping operation." Claim 9 of CA '844 further reinforces this where, after all the conditions are recited, it states "... while permitting the copper to be stripped after deposition is completed without damaging the cathode blank."

In other words, the thrust of CA '844 is to simply allow stripping of the deposited material without damaging the cathode blank. There is no discussion or suggestion of "two substantially equivalent sheets" and there is certainly no mention of a V-groove with an angle of 75-105 degrees.

Applicants respectfully submit the present invention is clearly inventive over and above CA '844. The requirement of separating the deposited material into two substantially equivalent sheets is neither recognized nor suggested by CA '844 and the inventive solution

provided by the present claims is absent from CA '844.

II. Conclusion

In view of the above, it is respectfully submitted the present claims are neither taught nor suggested by CA '844. Thus, a Notice of Allowance is respectfully requested.

Respectfully submitted,

Date:

August 3, 2006

By:

Anthony P. Venturino

Anthony P. Venturino

Registration No. 31,674

APV/bms

ATTORNEY DOCKET NO. APV31535

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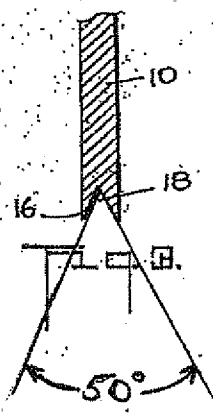
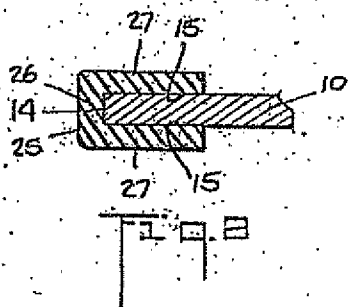
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# I



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